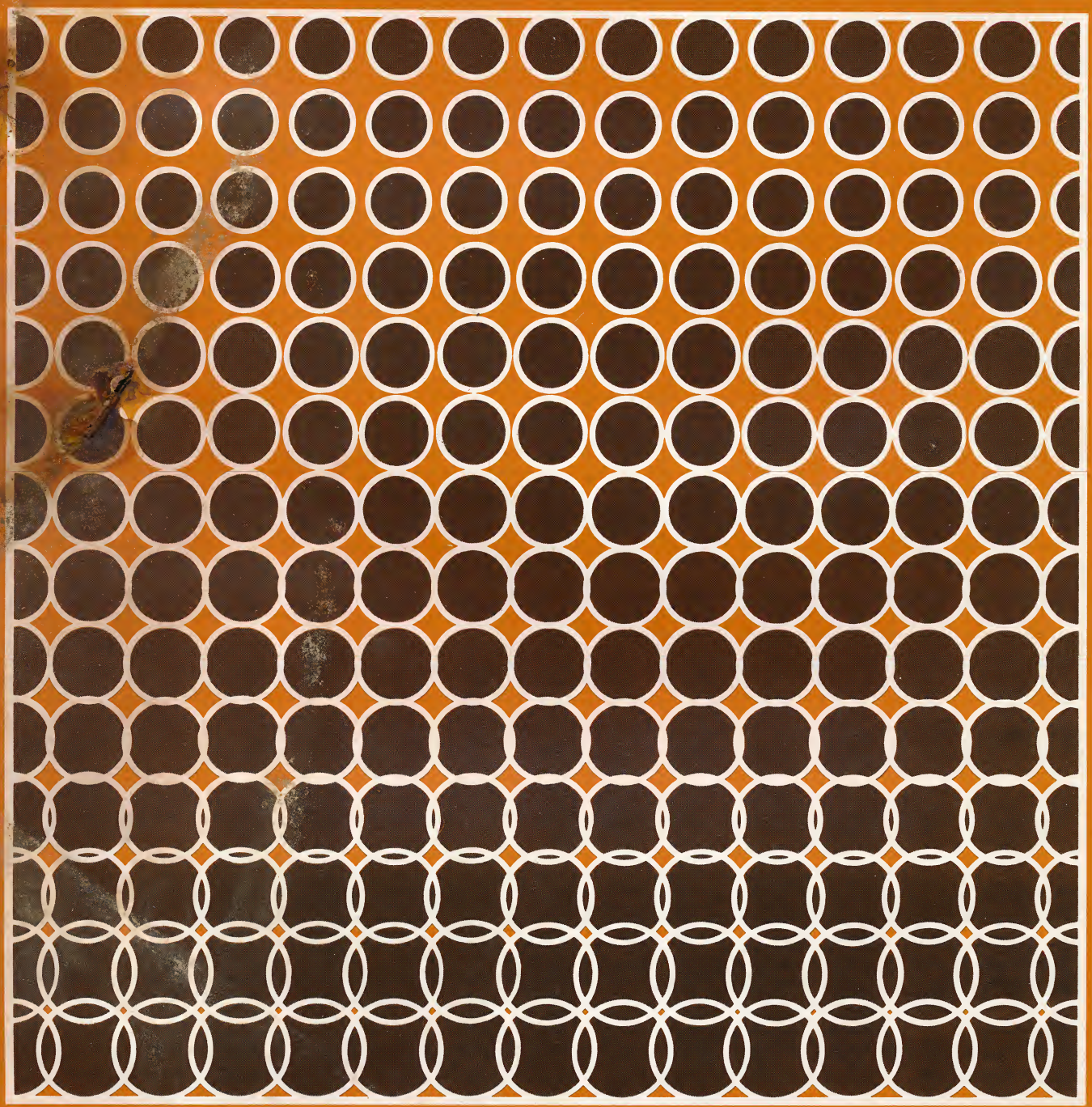
Nov 75

VERSATEC

Electrostatic Printers & Plotters



Why, where, and how to use Matrix electrostatic printers, plotters, printer/plotters, and proofers.

The quiet print revolution.

The primary responsibility for translating computer data into usable information is usually given to a computer printer. In virtually every data communication and processing application, somebody wants permanent, human-readable hard copy.

Impact printers, based on the same basic principle as the common typewriter, have been used to provide this hard copy. Now in many applications they are being replaced by nonimpact printers.

Impact.

The inherent weakness of impact printers is summarized in one word—impact. Whether using a type bar, ball, wheel, chain or drum, impact printers strike the printing surface with kinetic force. This mechanical action produces type wear, alignment problems, vibration, and noise. It increases maintenance cost and limits printing speed.

Involved stepping and driving mechanisms pushing moving hammers and springs require heavy support members and cases. Manufacturing cost is high.

While serial impact printers do produce a crisp full character impression, they lack the programmable resolution necessary for clear plots and graphs. (They simply can not place enough dots per square inch.)

Nonimpact.

There are many ways to produce a hard copy image without hammering ink on paper. Using chemicals and electronics, nonimpact processes include ink jet, optical, magnetic, thermal, xerography, electrographic and electrostatic.

Of these processes, the Matrix Electrostatic Writing Technique (MEWT™) has proved to be the most practical for most applications. Only the electrostatic process combines these advantages:

- No moving parts in the writing process
- High output speed
- Low initial cost
- Low operating cost
- Ability to produce high quality plots and graphs
- Ability to accommodate a wide variety of fonts, languages, and letter sizes

Simple, quiet and reliable. Using no moving parts in writing, the electrostatic process is entirely electronic. The only movements are in the paper transport and toner supply. Head life is in excess of five years.

In true electrostatic writing, electrostatic charges are placed directly on the paper. Although electrostatic charges are involved in ink jet and xerographic printing, these approaches require an intermediate step.

High throughput. Electrostatic devices offer the fastest writing speed of any nonimpact printer priced at under $10,000. Also, with the Matrix Electrostatic Writing Technique there is no reduction in printing speed with increased character set sizes.

True throughput is dependent on reliability. With no moving parts in the writing process, simplified paper transport, and easy-to-handle liquid toner, electrostatic units run faster longer.

Low cost. Typically, electrostatic equipment costs from $4,000-$8,000 less than comparable impact printers. Electrostatics are small in size; easy to install. While other nonimpact processes for straight alphanumeric printing enjoy a comparable price advantage over impact printers, none can deliver the performance/price ratio advantage of the electrostatic process.

Electrostatic units keep saving money. Monthly maintenance cost for impact printers in the same speed range is two to four times higher.

When the user needs both printing and plotting there is an added saving. A combination electrostatic printer/plotter can replace a line printer and a pen plotter, saving from $10,000 to $15,000. Other nonimpact techniques have not been proven for quality plotting.

Printing and plotting quality. Electrostatics offer equal or better print quality than other nonimpact units. And while serial printers may have an edge in low volume word processing print quality, electrostatics have the higher resolution (dots per inch) necessary for easy to read plots and graphs. They also have the capability to produce alphanumerics in any size.

Versatility. Electrostatics combine high reliability, speed, low cost, and wide printing/plotting capability. They can write characters that vary in font, language, size, boldness, and number. They can display any kind of alphanumerics. They can plot without changing hardware. They can write complex upper and lower

case characters, and intermix alphanumerics and graphics without reducing printing speed. This kind of versatility leads to the selection of electrostatics for a wide range of data communication and processing applications.

The leader in electrostatics.

When buyers in a recent COMPUTER DECISIONS study were asked which manufacturer they would consider in planning purchases of printers, they chose Versatec over all other electrostatics.

Versatec electrostatic hard copy units are used in twice as many installations as competitive units. They are used in more on-line installations. They are the one electrostatic chosen for OEM sales by the leading minicomputer manufacturers.

Why Versatec?

Readability and appearance. Three major factors affect print and plot readability: resolution, matrix size, and density. The greater the resolution, as expressed in dots per inch, the more the individual dots blend together to form continuous lines and well-defined, easy to read copy. Versatec units provide up to 200 points per linear inch. When plotting, this means that 40,000 points are available within one square inch.

Matrix size is important, too. In a 16 x 16 matrix, 256 points are available to create one character. Versatec units print an individual character or define a plot with up to four times the resolution of competitive units, and with eight times the resolution of serial printers.

Density affects appearance. Versatec *dual array* writing heads produce an overlapping dot structure that provides perfectly continuous lines and a darker, denser image.

Only Versatec offers units with 160 and 200 dots per inch resolution, a 16 x 16 matrix, and dual array density.

An exclusive type font, Versatec Roman, further enhances readability. It was designed expressly for electrostatic printing.

In plotting applications, Versatec software (Versaplot™) offers four choices in line thickness and a TONE subroutine that shades bounded areas with a wide selection of dot patterns. Appropriately shaded patterns add much to the appearance and communications value of graphs. While shading is possible with other electrostatic plotters, Versatec software makes such toning far easier and more practical.

Choice. Versatec gives you the widest selection of models, performance specifications, and computer interfaces along with the industry's most comprehensive software. Choose from printers, plotters, printer/plotters, and proofers. Select on-line controllers to interface with most popular computers, or go off-line with MAPPS print/plot units and proofer/paper tape reader systems.

Over twenty printers, plotters, and printer/plotters, seven proofers, and controllers that interface with more than twenty computers offer a perfect fit of user requirements. Powerful *Universal Versaplot Software*™ adapts to virtually any computer application.

Versatec offers more models than all competitors combined. And only Versatec offers truly universal software.

Reliability: Mean time between failures in excess of 3,000 hours. All electrostatic devices share the reliability that comes from using no moving parts in the writing process. We've further enhanced reliability with special features.

Versatec Matrix units carry paper in a sealed compartment. This protects paper from extremes in humidity. Competitive units do not have a sealed paper compartment.

Versatec Matrix units use a differential drive that eliminates paper tracking problems, even if the roller gets dirty. Other systems use a solid drive roller that can allow paper to skew and tear.

Versatec Matrix units carry small electronic modules in protected compartments. Other systems expose some electronics. They also use larger circuit cards that hamper troubleshooting and increase replacement costs.

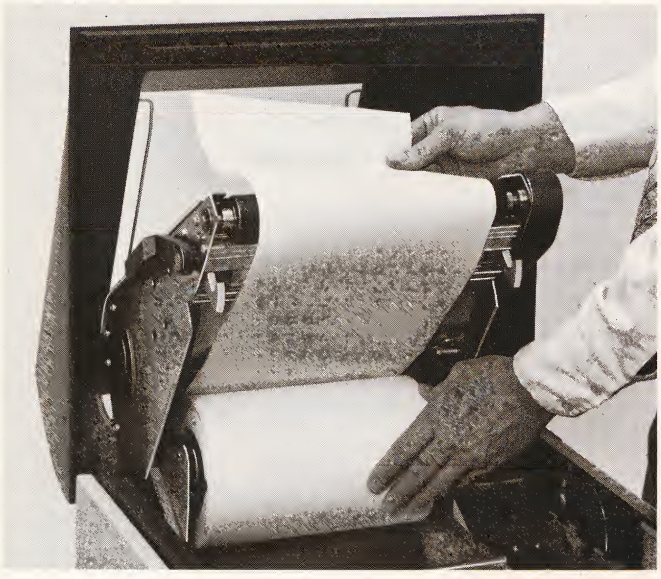
Fan-fold paper output stacks neatly and automatically in basket.

Versatec Matrix units operate reliably throughout a humidity range of 10% to 95%. Others can claim only a humidity range of 15% to 85%. This is significant, especially if your office or plant isn't air-conditioned or if air-conditioning fails.

Basic design and special features make the Versatec Matrix the most reliable output device you can buy. That's why we can back it with the best warranty in the industry.

Operating features. Electrostatic output devices are simple, quiet, and easy to operate. We've made it even easier.

The Versatec Matrix head can be adjusted while running. Concentrate can be added on-line. The disposable toner container is bigger and easier to use than that supplied by other manufacturers.



Airtight paper supply compartment permits operation over a wide humidity range with no degradation in printout quality.

Our units guide and stack fan-fold paper into the receiving basket. Other electrostatic units require manual paper handling. This might seem a minor detail until you consider the cost of full-time attended operation, or the chaos created by pages of unstacked printout.

In plotting applications, the most significant operating advantage resides in software. Versaplot™ is the world's most powerful electrostatic plotting software. This power allows the programmer to construct virtually any graphic representation with a few words of instruction. Subroutine orientation simplifies definition of any graph, even those requiring subtle shading. Also, a powerful instructional set and handling technique reduce computer core requirements.

Cost. You get more performance and fewer pounds for your money. Versatec units are smaller, lighter, and less expensive than other electrostatics. The difference can amount to several thousand dollars.

Our machines include many standard features that are optional on others.

A longer product line allows you to fit machine to application (print, plot, print/plot, or proof)—and special requirement (paper width, speed, print quality). Buying the specific capability needed saves money.

You keep saving money, too. Our paper costs less than that supplied by competitors. Our spare parts cost less. And our better warranty protects your investment.

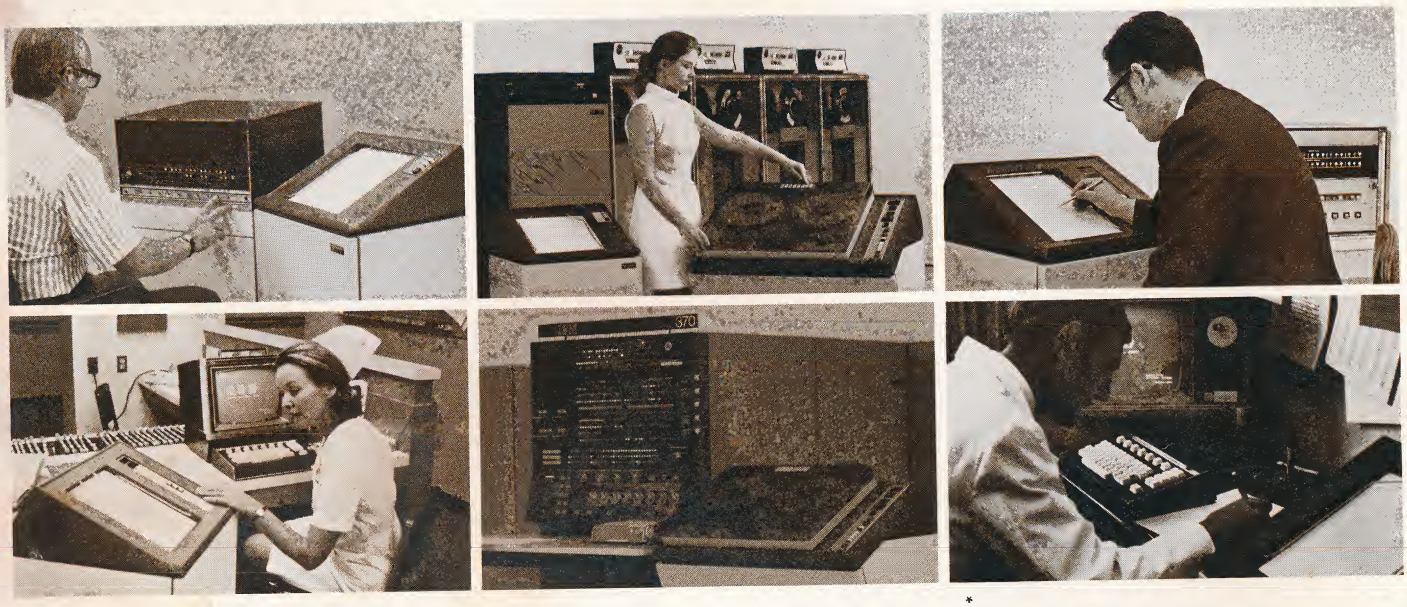
Why Versatec? Whose printer can print 132 columns at 500 lines per minute with a MTBF in excess of 3,000 hours for less than $5,500? What one machine can print 1200 lines a minute or plot at three inches per second with *dual array* density? What plotter uses the world's most powerful electrostatic plotting software?

Versatec has it all. More models. Better print and plot quality. The best price/performance ratio in the industry.

Where can you use Matrix hard copy output?

Just about anywhere.

General EDP applications. Versatec Matrix units are used as line printers, as output devices with alphanumeric and graphic CRT display systems, as remote printers in dedicated and time share systems, and as output terminals in computer storage and retrieval systems. They are used for straight line printing, program listing/software development, and data collection/logging applications.



*

Ability to handle high speed data transmission (up to 9600 BPS), extremely quiet operation, and excellent reliability make Matrix units particularly well suited for remote printing locations outside the protective environment of the computer room. Matrix plotters make reports more meaningful through presentation of data in graph form.

Computer design and analysis. Computer-aided design of integrated circuits and printed circuit boards, architectural and construction simulations, and other computer designed plots make good use of the Matrix plotter's ability to convert massive data into revealing graphics. Printers and plotters are also used in many microwave and electrical component test systems applications.

Scientific applications. Versatec on-line and off-line output devices plot geophysical/seismic data, weather maps, bar codes, and histograms. They are used in computer automated instrumentation systems for mass spectroscopy, gas chromatography, and other data analysis.

Combination print/plot output devices allow printout of complex graphs and alphanumerics for studies in nuclear/particle physics, chemistry, geophysics, avionics, and other applications throughout science and engineering.

Medicine. Many units are used in medical research for such work as cardiac, cancer, and basic biological investigations, radiological analysis, and general biological/physiological health studies. Still other units are used for in-hospital patient care and monitoring.

Process and production control. High speed printing and plotting capabilities improve the effectiveness of production control in utilities (telephone, electrical, and gas), municipal systems (water supply, waste treatment, vehicle control), and industry (chemicals, pulp and paper, etc.)

*Courtesy Spectra Medical Systems, Inc.

Printing and publishing. High speed Matrix Proofers produce inexpensive proof copy for newspaper and print shop phototypesetting operations. Matrix Printers, which can produce alphanumeric characters in any size, are being used for labeling in production, inventory, and merchandising applications.

Which Versatec Matrix unit is best for your application?

Printer, plotter, printer/plotter, or proofer? For fast, reliable, low cost alphanumeric printing without plotting, specify a Matrix Printer. In applications, such as graphing of scientific data, where plotting is the primary job and alphanumerics are incidental, use a Matrix Plotter. When high volume printing *and* plotting are needed, consider a Matrix Printer/Plotter. (This dual capability costs little more than a plotter alone.) For fast, inexpensive proof copy production, use the Matrix Proofer.

How much print detail? After the basic Matrix model-type has been selected, the user can choose desired print detail and quality.

Versatec Matrix units offer resolution from 100 dots per inch through 200 dots per inch. As the number of dots per inch increase, print and plot definition is improved.

A corresponding change in the size of matrix describes the number of dots used to form each character. With a 5 x 7 dot matrix, 35 points are available to form a character. A 7 x 9 matrix provides 63 points. With a 16 x 16 dot matrix, 256 points are available to create each character.

Font: 16x16 dot matrix
"Versatec Roman"
Resolution: 200 dots/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
abcdefghijklmnopqrstuvwxyz{|}
^_ !"#$%&'()*+,-./0123456789:
;<=>?@~■‘
```

Font: 16 x 16 dot matrix
"Versatec Gothic"
Resolution: 200 dots/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
abcdefghijklmnopqrstuvwxyz{|}
^_ !"#$%&'()*+,-./0123456789:
;<=>?@~■‘
```

Font: 16 x 16 dot matrix
"Versatec Courier"
Resolution: 200 dots/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ[¢]↑
abcdefghijklmnopqrstuvwxyz¶↓±§
!"#$%&'()*+,-./0123456789:;
½=¾?@
```

Font: 7x9 dot matrix
Resolution: 100 dots/inch

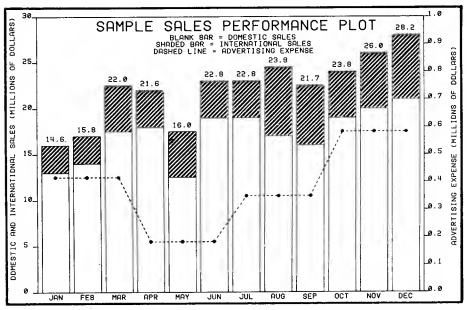
```
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
abcdefghijklmnopqrstuvwxyz{|}
↑← !"#$%&'()*+,-./0123456789:
;<=>?@~■►
```

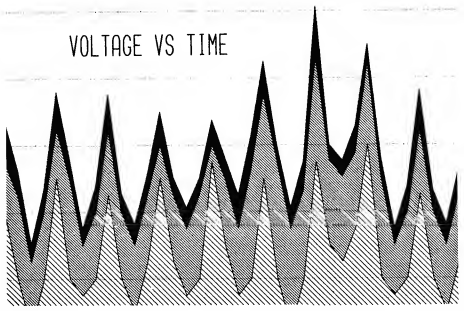
Font: 16x16 dot matrix
"Versatec Roman"
Resolution: 160 dots/inch

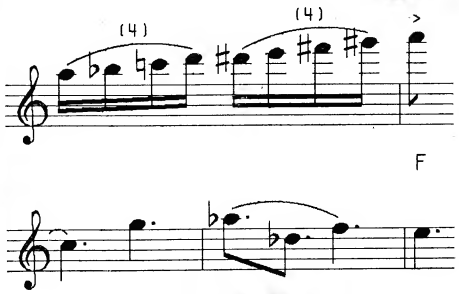
```
ABCDEFGHIJKLMNOPQRSTUVWX
YZ[\]^_~■‘abcdefghijklmn
opqrstuvwxyz{|}!"#$%&'()
*+,-./0123456789:;<=>?@
```

Kanji (Software generated)
Font: 24x24 dot matrix
Resolution: 160 dots/inch

搾 嬶 寰 嬶 搾 寰 嬶 搾
寰 搾 嬶 搾 寰 嬶 搾 寰
嬶 寰 搾 寰 嬶 搾 寰 嬶







Electrostatic plotters and printer/plotters can produce hard copy of any computer generated graphics for business, science or education.

The 96 character samples shown above were produced on Matrix units operating in a "print" mode from ASCII input. Characters are produced by MOS ROMs which are included in all printers and printer/plotters. The Japanese Kanji were produced by software.

To further enhance readability, all models are available with *dual array* writing heads. The *dual array* produces an overlapping dot pattern with greater density and contrast.

How much image quality do you need? Application and aesthetics are the determining factors. High resolution, larger matrix, and dual density allow communication of subtle distinctions in plots and graphs. Alphanumerics are more sharply defined and easier to read.

In cases where the printing is done in Japanese or Chinese, high resolution and a large matrix are essential to achieve accurate idiogram detail. On the other hand, simple bar charts, straightforward numerical reports, and other undemanding printouts are quite readable when produced in lower resolution and smaller matrices.

What format? Matrix models are available for 8½, 11, 20, 24, 36 or 44 inch wide paper.

The most popular choice for most printing and plotting applications is the 11 inch wide unit. It provides the standard 132 columns per line on an 11 x 8½ inch page. It offers a convenient format for plotting.

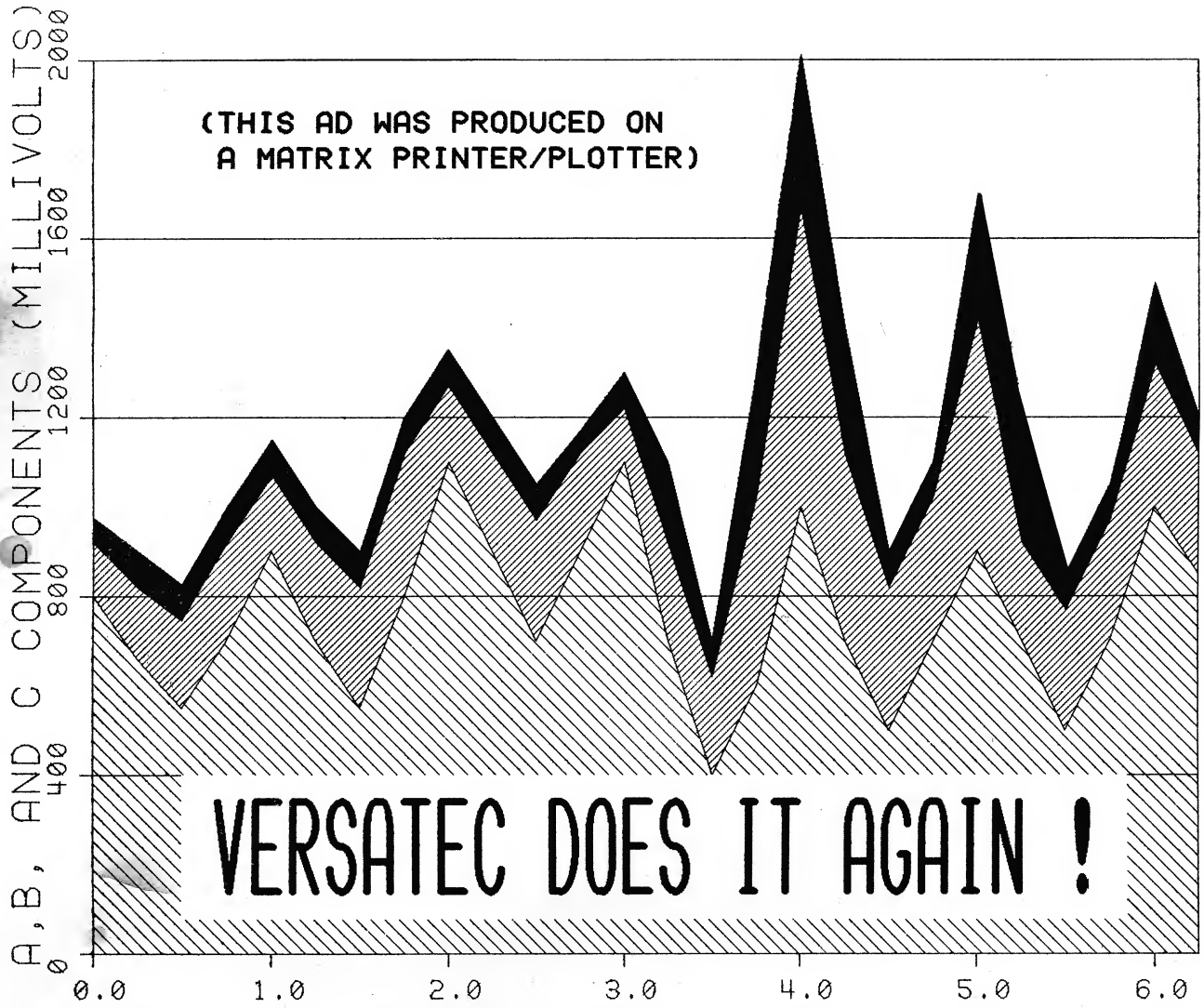
Looking for the lowest cost? When an 80 column format is sufficient, an 8½ inch wide paper width reduces system cost. This size is often selected for use with CRT display terminals, and for printing and plotting of standard 8½" x 11" documents.

Need super-wide graphics? Large size graphics can be accommodated by 20, 24, 36, or 44 inch wide Matrix units. *For more information on extra wide Matrix units, write for "Matrix Plotters and Printer/Plotters: 4400 Series" (Bulletin No. 133).*

Speed. All Matrix models are designed to operate at speeds compatible with popular small and medium size computer systems. Printer speeds range from 300 to 1,000 lines per minute. Plotters and Printer/Plotters plot at from 0.45 to 3 inches per second, and print 190 to 1,200 lines per minute.

With electrostatic devices, speed is seldom a limiting factor. Faster Matrix models may be of value when processing an extremely large amount of data or when very rapid printout is desired.

Important. When speed is an important consideration, be sure to compare speeds using asynchronous operation. While Versatec Matrix units operate asynchronously up to maximum speed, certain other electrostatic devices require synchronous operation for high speed copy generation. They slave the computer to produce constant data rates. This can result in costly system performance.



WE'RE NOW DELIVERING
UNIVERSAL MINI-COMPUTER PLOTTING SOFTWARE

WE'VE CREATED A POWERFUL NEW PLOTTING SOFTWARE SYSTEM WRITTEN IN FORTRAN THAT FITS VIRTUALLY ANY MINI-COMPUTER --- EVEN YOURS.

IT'S CALLED **UNIVERSAL VERSAPLOT SOFTWARE.** AND IT'S BEEN DESIGNED TO WORK WITH OUR ELECTROSTATIC PRINTER/PLOTTERS.

IT DOES INCREDIBLE THINGS. FOR EXAMPLE, OUR 200 POINTS-PER-INCH MODEL 1200A PRINTER/PLOTTER AND A 16K MINI-COMPUTER GENERATED THIS ENTIRE PAGE,EXACTLY AS YOU SEE IT HERE. PRINTING, PLOTTING, SHADING --- THE WORKS!

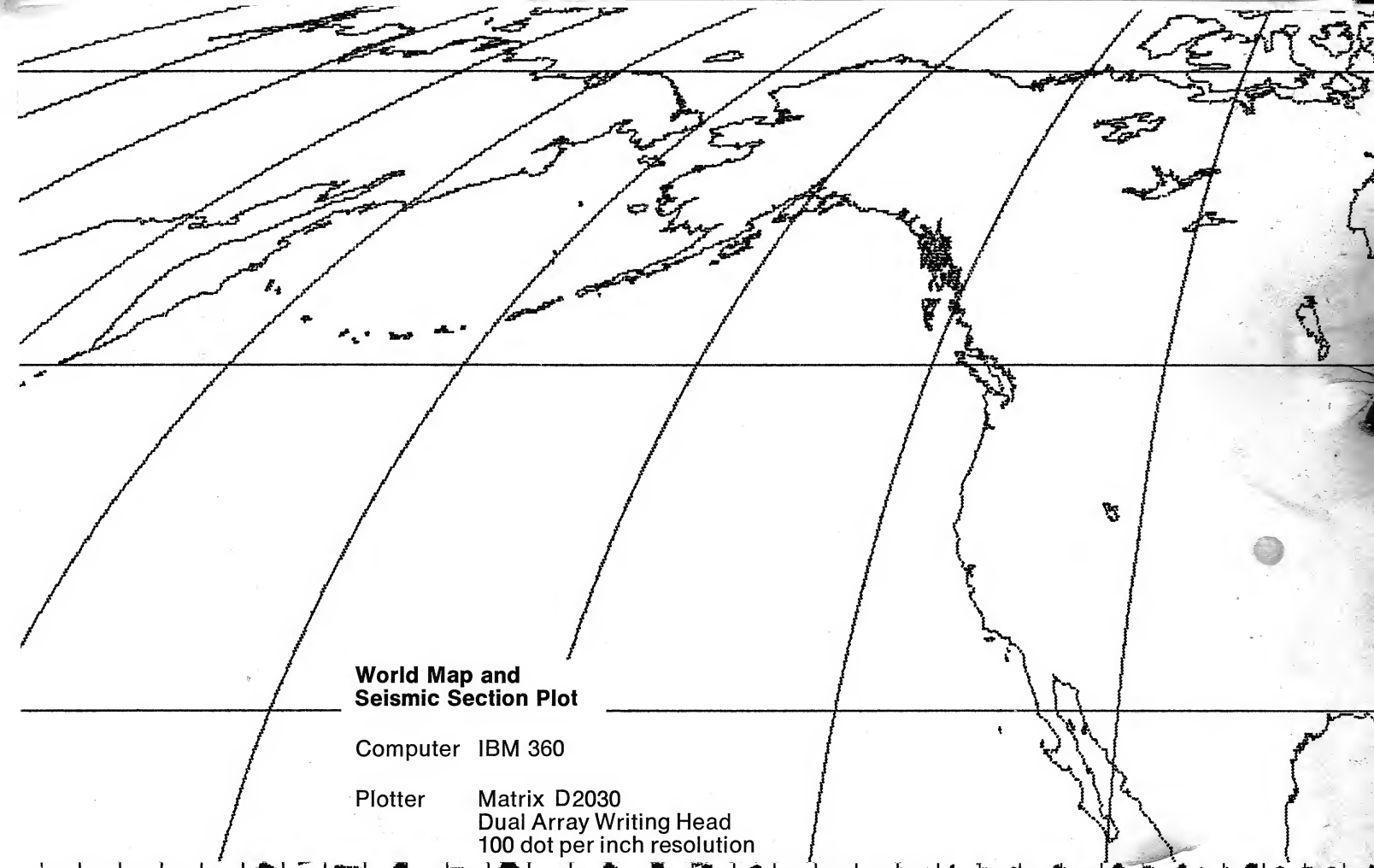
WHAT'S MORE, WE COULD HAVE EVEN DONE IT IN JAPANESE (日本語) ON A COMPUTER MADE IN NORWAY.

THE PRICES ARE EQUALLY IMPRESSIVE. A TYPICAL SYSTEM --- 1,000 LPM PRINTER, 100 POINTS-PER-INCH PLOTTER, MINI-COMPUTER INTERFACE, AND THE UNIVERSAL VERSAPLOT SOFTWARE --- SELLS FOR LESS THAN $10,000. OTHER COMPLETE SYSTEMS ARE $7,300 TO $14,300.

NOW EVERYONE CAN USE GRAPHICS TO MAKE DECISION MAKING EASIER. VERSAPLOT WORKS WITH MIDI AND MAXI COMPUTERS, TOO.

THE PLOT THICKENS WHEN YOU WRITE FOR MORE INFORMATION TO:

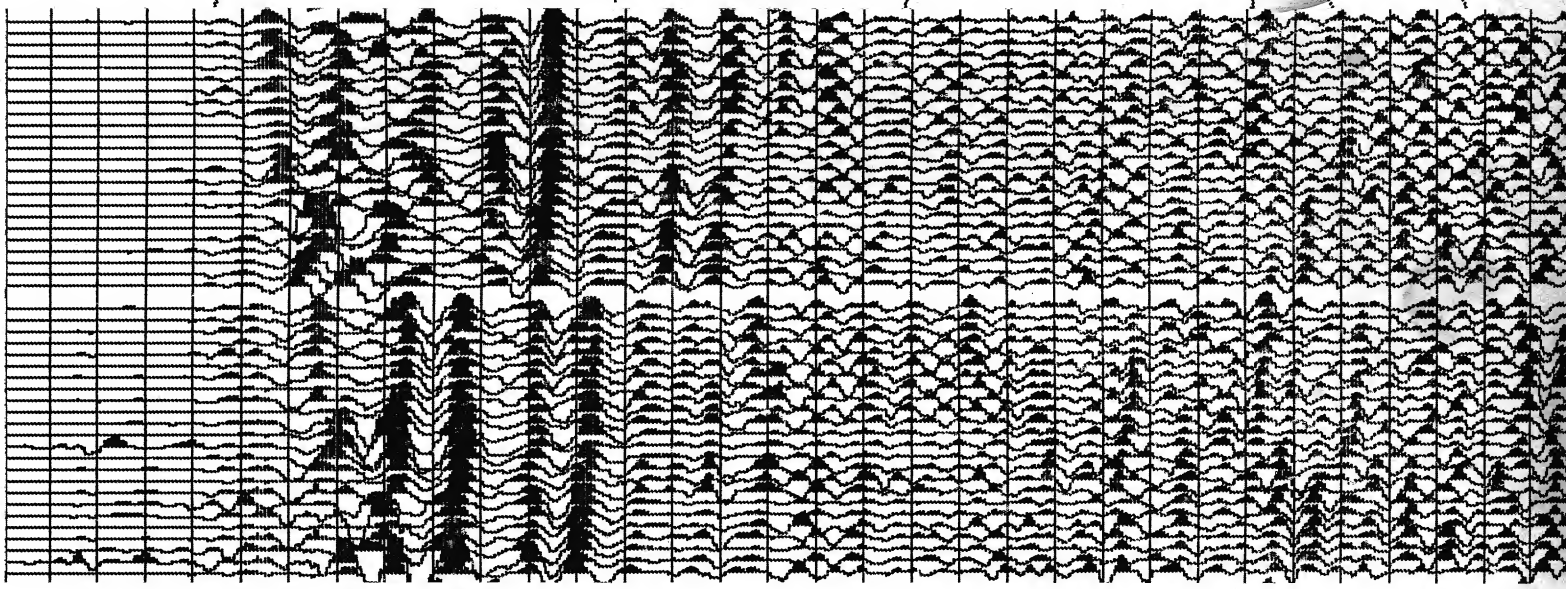
VERSATEC, INC.
10100 BUBB ROAD
CUPERTINO, CALIFORNIA 95014
(408) 257-9900

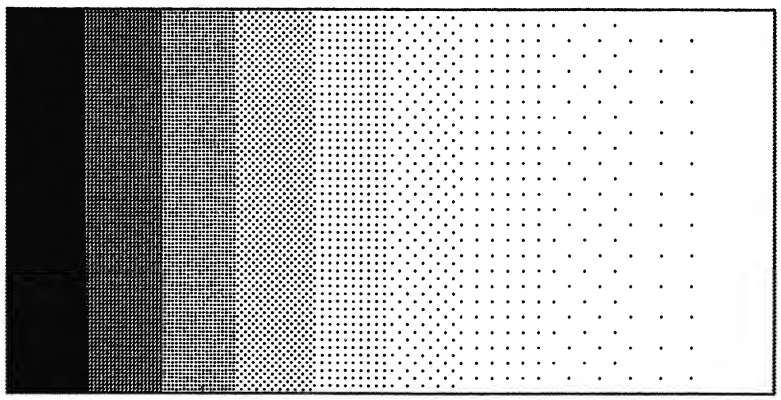


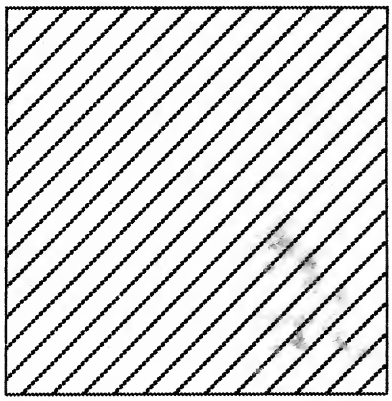
World Map and Seismic Section Plot

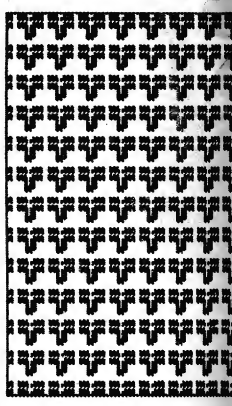
Computer IBM 360

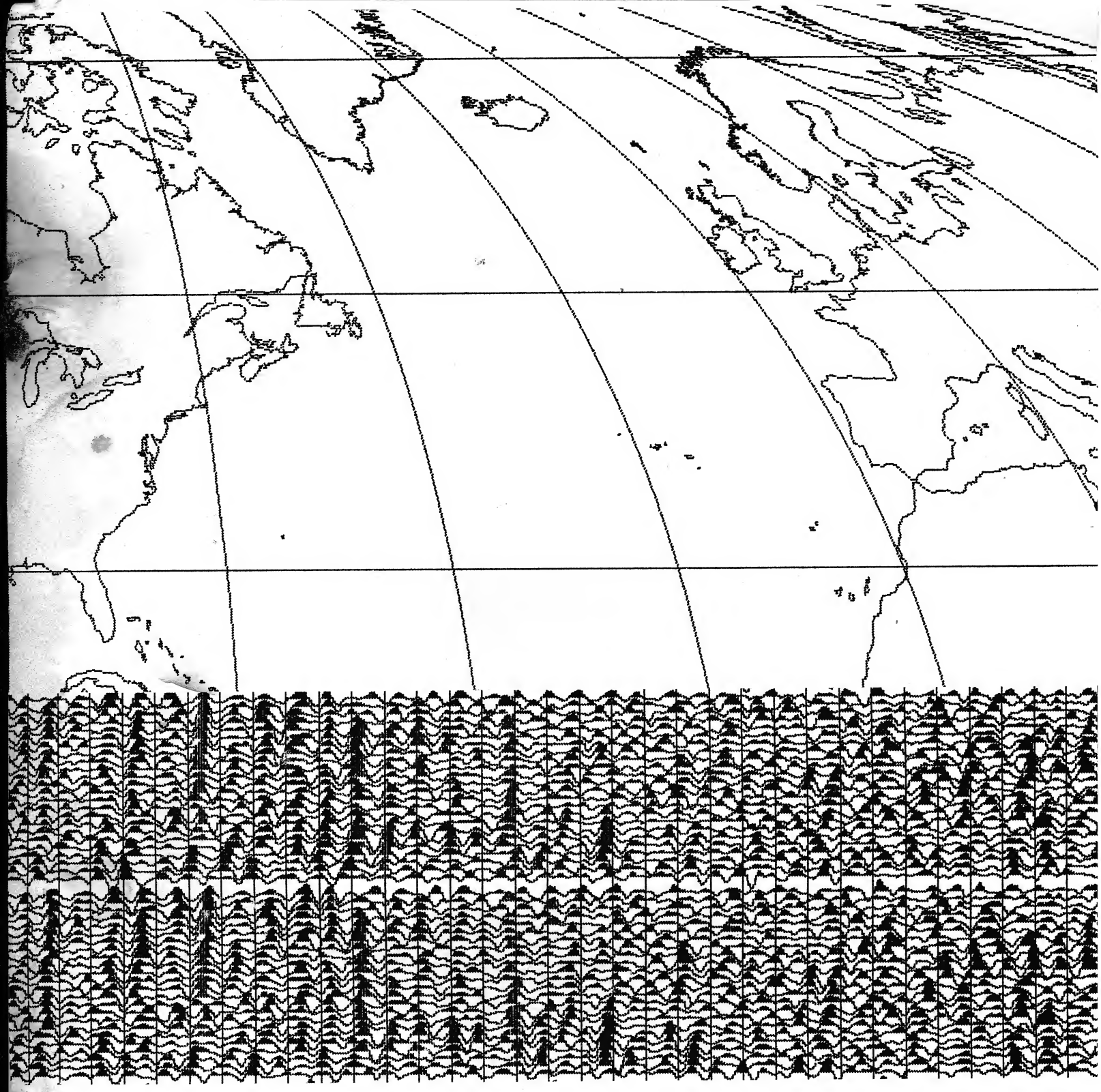
Plotter Matrix D2030
Dual Array Writing Head
100 dot per inch resolution

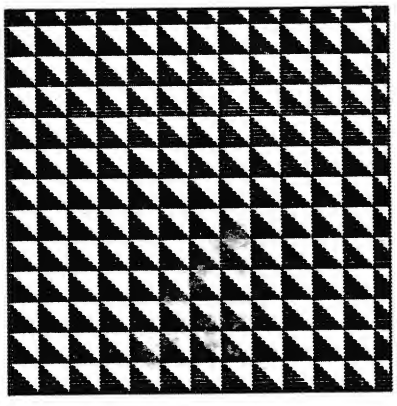


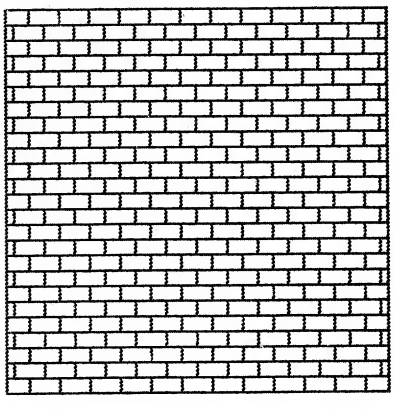












Examples of Versaplot Tone Patterns

Computer PDP-11/20 DOS

Plotter Matrix D2030
Dual Array Writing Head
100 dot per inch resolution

Matrix Print Samples

MINI-MATCHED PRINTERS FOR YOUR MINICOMPUTER

produce needed documentation. Print timely reports. Plot revealing graphs. Do it all with your minicomputer and mini-matched Versatec printers, plotters, and printer/plotters.
It's a perfect marriage. Here's why.....

MINI-PRICED. You can buy a Versatec printer that prints a full 132 columns at 500 lines per minute for less than $5,500. That's $4,000 to $13,000 less than a comparable impact printer. Or if you want printing and plotting, one Versatec printer/plotter replaces a line printer and a pen plotter, saving from $10,000 to $20,000.

Resolution: 200 dots/inch
16 x 16 dot Matrix
Versatec Roman Font

MINI-ENVIRONMENTS. More minicomputers are being used in quiet office environments and decentralized installations. Versatec printers use no moving parts in the writing process. They are whisper-quiet and have a MTBF in excess of 3,000 hours.

MINI-CORE. Some plotters demand extensive core. Versatec plotters, using exclusive VERSAPLOT software require only 16 to 32k bytes of core. With a minimum system, you can plot a typical 11 x 8 1/2 plot in a few minutes, and make additional copies in less than 10 seconds each.

Versatec Courier Font

MINI-VERSATILITY. Minicomputers are often assigned to new and changing applications. Versatec printers can write characters that vary in font, language, size, boldness, and number. They can display any kind of alphanumerics. They can plot without changing hardware. They can write complex upper and lower case characters, and intermix alpha-numerics and graphics without reducing speed.

MINI-MATCHED. With the largest product line in electrostatic printing. Versatec has the right machine for your mini and your application.
Find out why Versatec has over 2,000 installed MATRIX units and outsells other electrostatic units two to one.

Versatec Gothic Font

BUT WHAT ABOUT SOFTWARE? VERSAPLOT. THE WORLD'S MOST POWERFUL RASTER SCAN PLOTTING SOFTWARE FOR ELECTROSTATIC DEVICES. ALLOWS THE PROGRAMMER TO CONSTRUCT VIRTUALLY ANY GRAPHIC REPRESENTATION WITH A FEW WORDS OF INSTRUCTION. SUBROUTINE ORIENTATION SIMPLIFIES DEFINITION OF ANY GRAPH EVEN THOSE REQUIRING SUBTLE SHADING. ALSO, A POWERFUL INSTRUCTIONAL SET AND BANDING TECHNIQUE REDUCE COMPUTER CORE REQUIREMENTS.

Resolution: 100 dots/inch
7 x 9 dot Matrix
Upper case letters only

Pen plotters are being replaced in many computer plotting applications by Versatec electrostatic plotters and printer/plotters. It's not surprising. Versatec units use no moving parts in the writing process. No moving pens, arms, gears, springs, or hammers. Just a quiet hum as plots are produced at up to three inches per second paper speed. This quiet simplicity means lower initial cost and lower operating cost.

Upper and lower case letters

This high speed printer prints, copies and collates directly from cassettes without the use of the automatic typewriter, external office copier or collator. Quick-writer prints from 1 to 99 copies in collated order at a speed of nine seconds per page. Approximate cost per page: $.02.

Resolution: 160 dots/inch
16 x 16 dot Matrix
Versatec Courier Font

Matrix Model Selection Chart

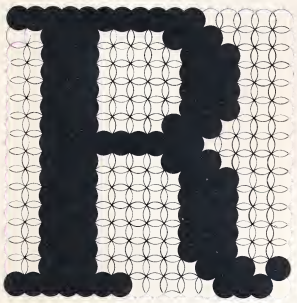
Function	Speed Asynchronous		8½ Inch		11 Inch			20 Inch	
	Print LPM	Plot IPS	Fan-fold (1000 sheets) 8½ x 11 inches or roll 8½ inches x 500 feet long		Fan-fold (1000 sheets) 11 x 8½ inches or roll 11 inches x 500 feet long			Roll only 20 inches wide 500 feet long	
Printers	300					LP-D1616			
	500		LP-810		LP-D1150		LP-D1250		
	600			LP-D960					
	1000				LP-D1175				
Plotters and Printer/ Plotters (Printer/plotter model numbers have suffix "A")	190	0.45							D2160 D2160A
	300	0.75				D1600 D1600A		D2000 D2000A	
	500	1.0					D1200 D1200A		
	500	1.2	D800 D800A		D1100 D1100A				
	600	1.25		D900 D900A					
	600	1.6							
	1000	2.4			D1110 D1110A				
	1200	3.0						D2030 D2030A	
Resolution, Dots/Inch Vertical and Horizontal			100	200	100	160	200	100	160
Writing Head Configuration			Dual Array	Dual Array	Dual Array	Dual Array	Dual Array	Dual Array	Dual Array
Total Writing Nibs			800	1600	1024	1600	2112	1856	2880
Font, Dot Matrix			5x7	16x16	7x9	16x16	16x16	7x9	16x16
Characters Per Inch			12.5	12.5	12.5	10.0	12.5	12.5	10.0
Columns Per Line			100	100	132	100	132	232	180
Printed Lines Per Fan-fold Page (min/factory setting/max)			1/70/96	1/84/100	1/54/73	1/60/63	1/64/75	Roll Paper ONLY	
Printed Lines Per Inch (Factory Setting)			6.6	8.0	6.6	7	8.0	6.6	7
Plot Width, Inches			8.00	8.00	10.24	10.0	10.56	18.56	18.0
ASCII Character Set Standard Optional			64 96 or 128	96 128	64 96 or 128	96 128	96 128	96 128	96 128
Simultaneous Print/Plot (SPP) for Printer/Plotters			Optional—not used with additional line buffer					Standard	
Additional Line Buffer			Optional—not used with SPP					Available for Plotters only	

How Matrix works.

All Versatec Matrix units share the same simple operating principle. They employ a proprietary writing process called Matrix Electrostatic Writing Technique (MEWT™).

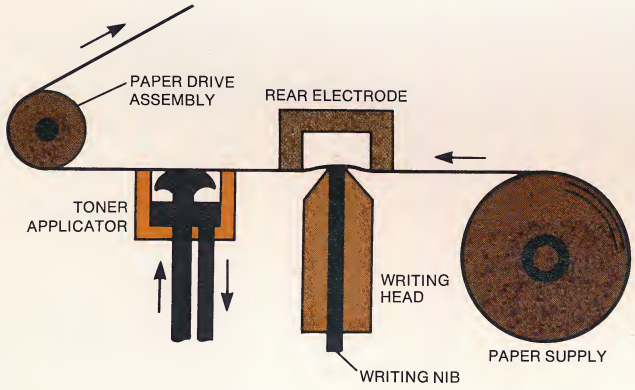
Programmed voltage is applied to an array of densely spaced writing nibs embedded in a stationary writing head. Upon digital command, the nibs selectively create minute electrostatic dots on the paper as it passes over the writing head. The paper is then exposed to liquid toner to produce permanent visible text or image.

As paper emerges from the unit, it is immediately ready to distribute and read. No special handling is required. The paper is insensitive to light and is reproducible on office copying machines.

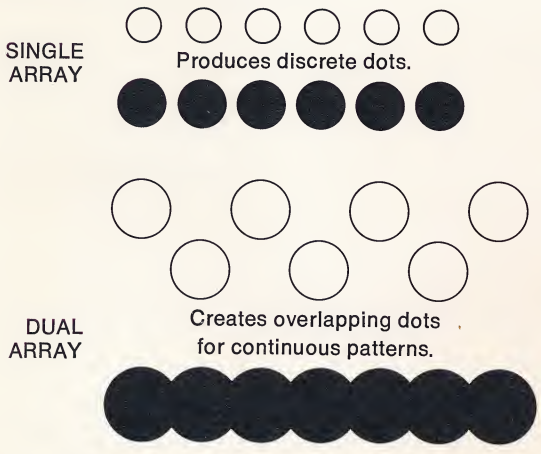


In the MEWT process, individual characters are formed using a dot matrix. Each character is made up of selected dots within a matrix.

Operating principle of Matrix units.



Two writing head configurations.



GENERAL

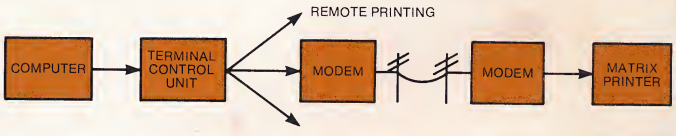
OFF-LINE

PROOFING

SERIAL INTERFACING

DISTRIBUTED PROCESSING ON-LINE WITH MINICOMPUTER INTERFACE

HARD COPY FROM CRT



TELEPROCESSING

REMOTE JOB ENTRY

Where and how Matrix fits in your system.

On-line.

Versatec Matrix printers, plotters, printer/plotters and proofers can be linked with most popular computers on a dedicated or time share basis. They can serve as a computer room line printer or be used at remote locations as an output terminal. (Acceptance of fast data transmission up to 9600 BPS speeds remote printout.) Working with a small minicomputer they can print or plot information in decentralized processing systems.

Standard Versatec controllers interface Matrix units with these computers:

Data General	Nova & Super Nova
Digital Equipment Corp.	PDP 8, 9, 11, 12, 15
Hewlett-Packard	2100, 2114, 2115, 2116
Honeywell	316, 416, 516
IBM	1130, 360, 370
Interdata	70, 74, 80, 85
Varian	620 and 73
Xerox	Sigma 2, 3, 5, 6, 7, 8, 9

Tektronix display terminals 4010, 4012, 4013, 4014, 4015.

A CRT interface to accept standard RS-170 signal output from CRT terminals is available.

For information about a particular controller, write for Controller Product Information Bulletin, and give your specific computer model. For information about interfacing to computers not listed above, write for "Interface Brochure" (Bulletin No. 6002).

Off-line.

Plotting. The Matrix Print/Plot System (MAPPS™) enables practical use of large computer systems for off-line printing and plotting. Operating with any Matrix printer, plotter, or printer/plotter, the MAPPS read-only magnetic tape deck collects data for printing or plotting. The MAPPS controller receives the data from the tape and strips off parity and control characters. Then observing proper timing and signal requirements for raster scanning, the controller transmits data to the Matrix unit.

Recording format: IBM compatible, 9 track or 7 track NRZI; 9 track phase encoded

Density: 9 track PE-1600 bpi
9 track NRZI-800 bpi
7 track NRZI-200, 556, or 800 bpi

Data transfer rate: 36,000 bytes/sec.

For more information, write for "MAPPS™ Off-line Matrix Print/Plot System" (Bulletin No. 300).

Proofing. Proofer/paper tape reader systems offer publishers and print shops automated proofing at a low entry cost. Punched paper tape codes include six level TTS programmed to user's specific requirements, ASCII 7 level, or ASCII 8 level. MOS ROM generate the 128 ASCII character set. Full one-line buffer, selectable PRINT/NO PRINT of phototypesetter instructions, and automatic line terminate features are included.

Proofers also available for on-line operation.

For more information, write for "Matrix Proofers for Phototypesetting Systems" (Bulletin No. 111).

Matrix Print/Plot System (MAPPS™) operating off-line with IBM 370

General Specifications

All Versatec Matrix units

Writing method:	Electrostatic.
Paper drive:	Incremental.
Switch panel controls:	Power on-off, paper advance, out-of-paper indicator, form feed.
Frame mounted controls:	Contrast, master reset, fan-fold/roll paper selector.
Toner supply:	2-gallon disposable reservoir.
Concentrate supply:	8 ounce bottle.
Operating environment:	Temperature: 32° to 105° F; relative humidity: 10% to 95% (non-condensing).
Power requirements:	100 VAC ±10%, 115 VAC ±10%, 200 VAC ±10%, 230 VAC ±10%; 48–62 Hz; 700 watts maximum (Specify voltages required for correct factory setting).
Dimensions/weight:	All 8½ and 11 inch Matrix units are 19″ wide, 18″ deep, 38″ high. They weigh 160 lbs.
	All 20 inch units are 28″ wide, 18″ deep, 38″ high. They weigh 180 lbs.
	Proofers with paper tape readers are 38″ high, 27″ wide, 18″ deep. Weight: 180 lbs.

Accessories and options

- Additional line buffers
- Simultaneous print/plot options
- Paper winding accessories
- Character sets
- Test modules

Detailed Dot Plotting Specifications

Models		Dot Size Mils	Dot Spacing Center to Center Mils	Max. Dot to Dot Position Deviation Mils		Maximum Accumulated Error
Plotters	Printer/Plotters			± Vert.	± Horiz.	
D800	D800A	13	10	2	2	All Models
D1100, D2000	D1100A, D2000A	13	10	2	2	Vertical 1½%
D1110	D1110A	13	10	4	2	Horizontal ½%
D2160	D2160A	8	6.25	2	1½	
D900, D1200	D900A, D1200A	7	5	2	1½	
D2030	D2030A	13	10	5	2	
D1600	D1600A	8	6.25	2	1½	

Matrix Input Signals

Printers ASCII, parallel and serial

Parallel 1 million ASCII characters/second maximum; TTL voltage levels

Serial Matrix operates asynchronously in a Receive-Only mode and is pin and voltage level compatible with RS232C standard. 10 or 11 bit code is accepted. Recommended operating rates are 600, 1200, 2400, 4800, and 9600 BPS. An optional serial synchronous interface for use with standard data sets is available.

Plotters Unweighted binary, parallel and serial

Parallel 1 million, 8 bit bytes/second maximum; TTL voltage levels

Model	Bytes/Scan	Maximum Scans/Sec Asynchronous
D800	100	120
D900	200	250
D1100	128	120
D1110	128	240
D1600	200	120
D1200	264	184
D2000	232	75
D2030	232	300
D2160	360	70

Serial operates asynchronously in Receive-Only mode; pin and voltage level compatible with RS-232C standards; accepts 10 or 11 bit code. Recommended operating rates are 2400, 4800, 9600 BPS. Optional serial synchronous interface for use with standard data sets is available.

Printer/Plotters

Signal input requirements for printer/plotters are the same as given above for printers and plotters. Print and plot inputs are made alternately via the same input connector by changing the logic level on a single input line.

Plotting software.

Two software systems: Versaplot I & II

Versaplot I is a flexible and efficient FORTRAN subroutine oriented program designed specifically for use with Matrix plotters and printer/plotters. Predefined operations incorporated within the utility subroutines provide the power to execute detailed functions without laborious programming. At the same time, variable arguments with preset values carried in the program give the programmer an efficient way to adapt to special plotting requirements.

Using seven utility subroutines, the programmer can write any general purpose graphics program by describing plots as he would with a pen. The software converts graphics to raster data and optimizes the advantages of Matrix plotting.

Versaplot II is a compatible extension of pen plotter software. This software uses existing pen plotter subroutines, except for PLOT, which is replaced with a Versaplot PLOT subroutine that generates intermediate coordinate data and final raster output.

The user's investment in existing software is protected. Other subroutines and application programs normally require no modification.

Two software packages: Universal Versaplot Software (UVS) and Integrated Versaplot Software (IVS)

Universal Versaplot Software (UVS) is a comprehensive software package designed to accommodate any computer, operating system, or plotting application with minimum processing time and maximum programming flexibility. This package includes Versaplot I and II.

System-specific *Integrated Versaplot Software (IVS)* is available for certain computers and operating systems. While the *Universal Versaplot Software* can be used with any system, the integrated package has been designed to provide immediate on-line operation and enhanced computer system optimization. *Integrated Versaplot Software* is available in Versaplot I, or combined Versaplot I and II.

For more information, write for "The World's Most Powerful Electrostatic Plotting Software: Versaplot™" (Bulletin No. 112).

Supplies

A complete line of supplies is available for all Versatec Matrix units. Bottled supplies include pre-mixed toner in handy disposable bottles, concentrate, and clear dispersant for diluting toner and cleaning. Electrographic paper includes rolls, in standard and translucent stock, for 8½, 11 and 20 inches wide units; fan-fold paper, standard stock only, for 8½ and 11 inch wide units. Spare parts kits are available for servicing at PC card/module level or component level.

At no extra charge, each Matrix unit is shipped with an initial complement of supplies, including: Pre-mixed toner, toner concentrate, clear dispersant, two rolls of standard type 45R electrographic paper, one carton of Type 45F fan-fold paper (8½ and 11 inch models only) and a comprehensive operation and maintenance manual.

Proof of performance.

Versatec is the leading producer of electrostatic printers and plotters for display of original information. Over 3,500 Matrix units are producing hard copy in twenty-one countries.

Commitment to service.

In the United States, thirty service centers provide prompt, qualified installation and a choice of on call or full maintenance service plans. International service centers are located in Canada, the United Kingdom, countries in Western Europe, South America, Israel, Australia, Taiwan, and Japan.

For more information about service in the United States write for "Maintenance Service Program" bulletin.

The next step.

Tell us about your specific application. We'll send you specific literature and printout samples. For prices, warranty and delivery information, call your local Versatec representative. He will answer your questions and quietly demonstrate the power of Matrix hard copy output.

2805 Bowers Avenue
Santa Clara, California 95051
Telephone (408) 988-2800
TWX: 910-338-0243

Versatec European Headquarters
Hambridge Lane
Newbury, Berkshire, England
Telephone (0635) 42421
Telex: 847259